`CARBOHYDRATE METABOLISM

1. Gluconeogenesis:

a) Is favoured when isulin concentration is high
b) Occurs in the liver during prolonged fasting
c) Allows skeletal muscle to produce glucose for export to blood for use by the CNS
d) Is stimulated by high levels of glucose-6-phosphate
e) Uses Acetyl CoA as substrate

2. Glucose-6-phosphate dehydrogenase:

a) Is the key enzyme in glycogenesis
b) Is activated by high levels of $NADP^+$
c) Catalyzes conversion G6P to fructose-6-phosphate
d) Is important in muscle during exercise
e) Not found in RBC's

3. In the TCA cycle*:*

a) 3 ATP's are produced by substrate-level phosphorylation
b) Oxygen is directly involved
c) All reactions are reversible
d) Succinyl CoA is the precursor for Heme synthesis
e) Oxaloacetate is converted to pyruvate

4. The following can be synthesized from glucose in the human body:

a) Ribose and lactose
b) Lactose and cellulose
c) Sucrose and ribulose
d) Cellulose and fructose
e) Fatty acid sucrose

5. Glucose-6-phosphate deficiency:

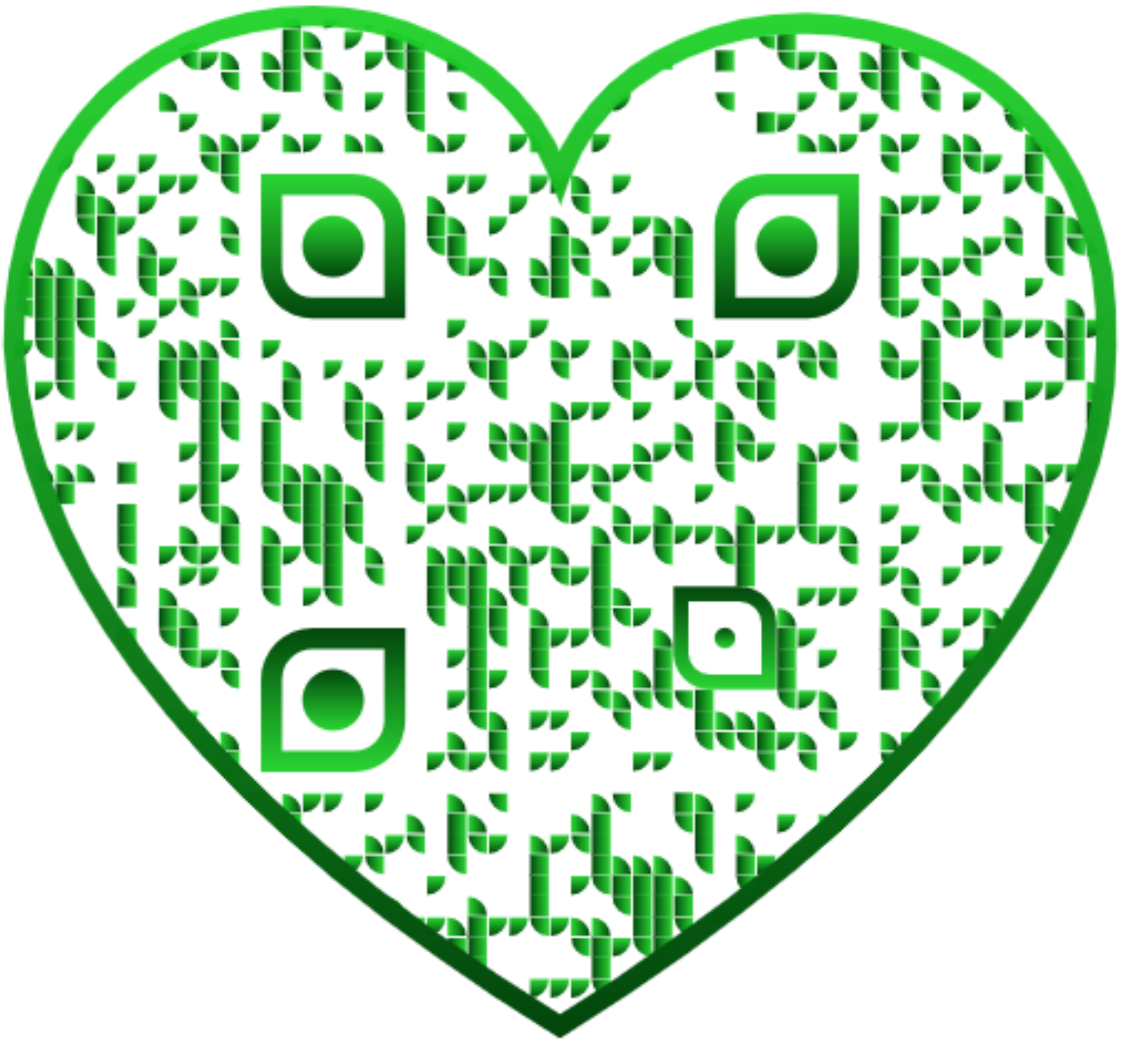
a) Is known as Von Gierke's disease
b) Is associated with hypoglycemia in the fed state
c) Inhibits the last step of glycogenolysis and gluconeogenesis in the liver
d) Is associated with hyperuricemia
e) B is the only wrong statement

6. In glycogenesis*:*

a) ATP is required
b) Phosphoglucomutase catalyses irreversible step
c) Glucose residues are added to the reducing end of glycogen
d) Glycogen synthase is the key enzyme
e) 2 ATP molecules are consumed

7. In galactosemia*:*

a) Treatment involves restriction of glucose in diet
b) The liver function can be seriously affected
c) Galactose is deposited in tissues
d) Galactose is readily converted to glucose
e) Galactosuria is the most serious manifestation



8. Uncoupling of oxidative phosphorylation:

a) Decreases the oxygen consumption
b) Releases heat only
c) Occurs during hypoxia
d) Causes a buildup of NADH
e) Produces more ATP

9. The enzyme not involved in glycolyisis is:

a) Aldolase
b) Endolase
c) Pyruvate kinase
d) Phosphoglycerate mutase
e) Alpha phosphoglycerate dehydrogenase

10. Which of the following is not a glycolytic intermediate*?d*

a) Glucose-6-phosphate
b) Fructose-6-phosphate
c) Dihydroxyacetone phosphate
d) Pyruvate
e **)** Glycerol-3-phosphate

11. Which site utilizes glucose as an energy source exclusively in all conditions*:e*

a) Brain
b) Muscle
c) Liver
d) Fat cell
e) Erythrocyte

12. The following agent interferes with oxidative phosphorylation*:e*

a) Cyanide inhibits NADH-dehydrogenase
b) Carbon monoxide inhibits Coenzyme Q
c) Rotenone enhances electron transfer
d) Oligomyein inhibits electron transfer
e) Dintrophenol uncouples phosphorylation from electron transfer

13. The following compounds are part of the pyruvate dehydrogenase complex*:e*

a) Thiamin diphosphate
b) Lipoamide
c) CoA
d) NAD+
e) All of the above

14. UDP-G:

a) Is derived from vitamin B1
b) Is a substrate for the enzyme glycogen phosphorylase
c) Is intermediate in glycerophospholipid synthesis
d) Is not required for normal galactose metabolism
e) Can be formed from UDP-Galactose

15. Glycogen phosphorylase:

a) Is a mitochondrial enzyme
b) Is activated by dephosphorylation
c) Acts by the same mechanism as intestinal amylase
d) Produces uridine diphosphate from glycogen
e) Produces glucose-1-phosphate

16. Fructose 2,6 bisphosphate:

a) Is a glycolytic intermediate
b) Activates phosphofructokinase 1
c) Is synthesized by phopshofuctokinase 1
d) Enhances fructose 1,6 bisphosphate
e) Level in the liver is increased by glucagon

17. Pyruvate carboxylase*:*

a) Converts acetyl CoA to pyruvate
b) Requires carnitine
c) Converts pyruvate to oxaloacetate
d) Is activated by high fructose 1,6 bisphosphate
e) Requires pyridoxal phosphate

18. In glycogen storage diseases:

a) Von Gierke's disease is type III
b) Hypoglycemia is the main feature of type V
c) Type II is associated with glucose 6 phosphatase deficiency
d) Type IV is called Andersen's disease
e) Hepatomegally is the main feature of all types

19. Which of the following statements about galactosemia is correct:

a) Treatment involves restriction of glucose in the diet
b) A deficiency of glucokinase is the major case
c) Is treated by elimination of galactose from the diet
d) Can be treated by restricting sucrose in the diet
e) Is inherited as autosomal dominant character

20. Glucose-6-phosphate dehydrogenase:

a) Is the key enzyme in glycogenesis
b) Deficiency can cause hemolytic anemia
c) Catalyses conversion of G6P to fructose-6-phosphate
d) Is important in muscles during exercise
e) Is not found in RBC's

21. Synthesis of glucose from pyruvate by gluconeogenesis in the liver*:*

a) Occurs exclusively in the cytosol
b) Is inhibited during prolonged fasting
c) Requires participation of biotin
d) Requires lactate as intermediate
e) Occurs exclusively in the mitochondrion

22. In the TCA cycle:

a) Four NADH molecules are produced
b) Substrate-level phosphorylation occur by the action of sccinyl CoA thiokinase
c) The reactions can proceed in the absence of molecular oxygen
d) Fumarase reactions occur immediately after isocitrate dehydrogenases reactions
e) Glutamate dehydrogenase is a key enzyme

23. In fructose metabolism:

a) Deficiency of hexokinase results in fructosuria
b) Glucokinase is the major enzyme
c) Fructokinase phosphorylates fructose
d) Fructose 6 phosphate is produced by fructokinase
e) Aldolase A is the key enzyme

24. Oxidation of glucose by red blood cells gives:

a) Lactate + NADH+H
b) 36 ATP molecules per molecule of glucose
c) Lactate and NAD+
d) Carbon dioxide and water
e) 2 NADPH

25. The pentose phosphate pathway*:*

a) Produces ATP
b) Is a mitochondrial pathway
c) Is important for reductive biosynthesis
d) Is least active in the liver
e) Is inhibited by high glucose levels

26. The following agent interferes with oxidative phosphorylation*:*

a) Carbon monoxide inhibits cytochrome reductase
b) Cyanide inhibits NADH-dehydrogenase
c) Rotenone enhances electron transfer
d) Oligomyein inhibits electron transfer and phosphorylation
e) Dintrophenol enhances ATP synthesis

27. UDP-Glucose:

a) Is indirectly involved in bilirubin conjugation
b) Is a substrate for the enzyme 4-epimerase in lactating mammary gland
c) Is intermediate in sphingolipid synthase
d) Is required for galactose metabolism
e) All of the above

28. Glycogen synthesis*:*

a) Is a mitochondrial pathway
b) Is activated during the fasting state
c) Occurs in the liver and muscle
d) Produces uridine diphosphate from glycogen
e) All of the above

29. Pyruvate is:

a) Converted to acetyl CoA by pyruvate carboxylase
b) Four-carbon compound
c) Converted to oxaloacetate by pyruvate dehydrogenase complex
d) Converted to alanine by transamination
e) Intermediate in the TCA cycle

30. In glycogen storage diseases:

a) Fatigability and muscle cramps are main features of Von Geirke's disease
b) Hypoglycemia is the main feature of type V
c) Type II is associated with glucose 6 phosphatase deficiency
d) Type IV is called Andersen's disease
e) Hepatomegally is the main feature of all types

31. The following enzyme would be impaired in biotin deficiency:

a) Fructose 1,6-bisphosphate
b) Pyruvate kinase
c) PEP carboxykinase
d) Pyruvate carboxylase
e) Malate dehydrogenase

32. The following statement about the pentose phosphate pathway is correct:

a) Pentoses can be formed both oxidatively and non-oxidant
b) This pathway is important to fatty acid synthesis because it produces equivalents
c) Fructose 6 phosphate can be used to make ribose-5-phosphate
d) Glyceraldehyde-3-phosphate can be used to make dinitrophenol
e) All of the above are correct

33. The following is caused by deficiency in aldolase B*:*

a) Hereditory fructose intolerence
b) Jaundice
c) Hypoglycemia
d) Catarct
e) Ataxia

34. The rate of glycolysis in the liver is increased by:

a) Insulin
b) ATP
c) Citrate
d) NADH
e) Glucose 6-phosphate

35. The preparative step of glycolysis involves the following:

a) ATP synthesis at the substrate level
b) The incorporation of P_i into a triose phosphate
c) The reduction of NAD+ to NADH
d) The formation of 1,3-bisphosphoglycerate
e) Formation of triose phosphates from a hexose diphosphorase

36. The following is present in the liver, but is absent in muscles:

a) Pyruvate carboxylase
b) Glycogen synthase
c) Lactate dehydrogenase
d) Pyruvate dehydrogenase
e) Glucose-6-phosphatase

37. The following enzyme utilizes FAD as a coenzyme*:*

a) Malate dehydrogenase
b) Aconitase
c) Succinate dehydrogenase
d) Isocitrate dehydrogenase
e) Lactate dehydrogenase

38. A patient complaining of painful cramps in the legs during exercise and has easy fatigability, the most likely cause is*:*

a) Diabetes mellitus
b) Deficiency of glucose-5-phosphatase
c) Deficiency of the debranching enzyme or muscle phosphorylase
d) Defective glycogen synthesis
e) Over-storage of glycogen

39. Malonate inhibits succinate dehydrogenase because:

a) Binds irreversibly to the active site
b) Covalently modifies the enzyme
c) Resembles succinate but cannot react
d) Displaces he FAD coenzyme
e) Chelates a metal ion required by the enzyme

40. In oxidative phosphorylation*:*

a) An electrochemical potential is created across the inner mitochondrial membrane
b) ATP is synthesized from ADP and Pi
c) Protons are pumped into the interspace between the inner and outer mitochondrial membranes
d) The energy released from the electron flow is directly used for synthesis of ATP
e) D is incorrect

41. Phosphofructokinase-1:

a) Is activated by high level of ATP
b) Catalyzes the only irreversible reaction in glycolysis
c) Is activated by the high level of AMP
d) Converts fructose 1-phosphate to fructose 1,6-bisphosphate
e) Is costimulated with fructose 1,6 bisphosphatase

42. In gluconeogenesis:

a) Pyruvate is converted to acetyl CoA
b) Valine and Leucine are substrates
c) Energy consumption is high
d) Insulin is needed to enhance the synthesis of glucose
e) Acetyl CoA is a substrate

43. Glycogen synthesis*:*

a) Is typically the reverse of glycogenolysis
b) Is mitochondrial pathway
c) Is very active in adipose tissue
d) Requires uridine diphosphate-glucose as intermediate
e) Is activated by adrenaline

44. Galactosemia*:*

a) Causes mental retardation
b) Can cause liver failure
c) Is caused by deficiency of galactose-1-phosphate uridyl transferase
d) Can be treated by restricting galactose from the diet
e) All of the above is correct

45. The following can be obtained from the TCA cycle intermediates:

a) Fatty acids and glucose
b) Cholesterol and ketone bodies
c) Heme and glutamine
d) A, B and C are correct
e) Only B is correct

46. The tissue which can metabolize normally glucose, fatty acids and ketone bodies for ATP production is:

a) Liver
b) Skeletal muscle
c) Brain
d) Red blood cell
e) All of the above

47. All of the following compounds are part of the pyruvate dehydrogenase complex *except:*

a) Thiamine diphosphate
b) Lipoamide
c) Biotin
d) FAD
e) NAD+

48. Which of the following glycolytic intermediates is a close precursor to TAG*:*

a) Glucose 6 phosphate
b) Fructose 6 phosphate
c) Dihydroxyacetone phosphate
d) Pyruvate
e) 3-phosphoglycerate

49. The carbon skeleton of glucose can participate in the synthesis of*:*

a) Purine ring
b) Fatty acid
c) Glutamine
d) Pyrimidine ring
e) All of the above is correct

50. The following agent interferes with oxidative phosphorylation*:*

a) Cyanide inhibits NADH-dehydrogenase
b) Carbon monoxide inhibits coenzyme Q
c) Rotenone enhances electron transfer
d) Oligomyein inhibits electron transfer
e) Dintrophenol uncouples phosphorylation from electron transfer

51. In oxidative phosphorylation*:*

a) Ubiquinone transfers electrons from complex I to complex II
b) Dinitrophenol inhibits the flow of electrons
c) The electrons transported from one $FADH_2$ to oxygen will produce 3 ATP's
d) Complex IV contains copper
e) Complex III is called cytochrome oxidase

52. In galactosemia*:*

a) Cataract results from accumulation of galactose in the lens
b) The liver function can be seriously affected as a result of phosphate depletion
c) Galactose is deposited in tissues
d) Galactose is readily converted to glucose
e) Galactosuria is the most serious manifestation

53. The pyruvate dehydrogenase complex defect is mainly manifestd in the following condition:

a) Beriberi
b) Pellagra
c) Pernicious Anemia
d) Scurvy
e) Rickets

54. The committed step in glycolysis is catalyzed by:

a) Hexokinase
b) Phosphofructokinase-1
c) Pyruvate kinase
d) Phosphoglycerate mutase
e) Glyceraldehyde 3 phosphate dehydrogenase

55. The following agent interferes with oxidative phosphorylation*:*

a) Cyanide inhibits NADH-dehydrogenase
b) Carbon monoxide inhibits Coenzyme Q
c) Rotenone enhances electron transfer
d) Cyanide inhibits cytochrome oxidase
e) Oligomycin inhibits electron transfer

56. The pyruvate dehydrogenase complex:

a) Requires pyridoxal phosphate
b) Is inactive when thiamin is deficient
c) Deficiency results in pernicious anemia
d) Catalyses a carboxylation reaction
e) Is a key enzyme in the red blood cell

57. Activation of phophofructokinase-1 in the liver:

a) Inhibits hexokinase
b) Enhances gluconeogenesis
c) Enhances the activity of pyruvate kinase
d) Occurs as a result of high glucagons/insulin ratio
e) Results in accumulation of fructose-6-phosphate

58. Which of the following cells utilize glucose, fatty acid and ketone bodies as fuels*:*

a) Neuron
b) Myocyte
c) Hepatocyte
d) Adipocyte
e) Erythrocyte

59. Glycogen phosphorylase:

a) Is activated by insulin
b) Is activated by dephosphorylation
c) Requires inorganic phosphate
d) Produces uridine diphosphate glucose from glycogen
e) Is a key enzyme in gluconeogenesis

60. In oxidative phosphorylation:

a) Ubiquinone transfers electrons from complex I to complex II
b) Dinitrophenol inhibits the flow of electrons
c) The electrons transported from one $FADH_2$ to oxygen will produce 3 ATP
d) A decrease in oxygen supply increases the flow of the electrons through the complexes
e) An increase in the rate of ATP synthesis will decrease electron transport

61. Glycogen*:*

a) Is found in liver and muscle
b) Is a branched polysaccharide formed from glucose
c) Is responsible for maintenance of blood glucose level between meals
d) Excessively deposits in liver of von Geirk's disease patient
e) All of the above is correct

62. Fructose:

a) Enters directly into glycolysis as Fructose-6-phosphate in the liver
b) Is isomerized to glucose before catabolism
c) Is a potent lipogenic factor
d) Is produced from lactose
e) Is a non-reducing sugar

63. Hypoglycemia can result from:

a) Deficiency of debranching enzyme (Cori's disease)
b) Deficiency in glucose-6-phosphatase
c) Defects in beta oxidation in the liver
d) Insulin overdose
e) All of the above is correct

64. The common features of glycolysis and the PPP include*:*

a) Both pathways produce carbon dioxide
b) Both pathways use NAD as coenzyme
c) Both pathways are mitochondrial
d) Both pathways produce ATP
e) Both pathways occur in RBC's

65. Gluconeogenesis:

a) Is the reversal of glycolysis
b) Is active during prolonged fasting
c) Requires participation of carnitine
d) Uses acetate as substrate
e) Is very active in the fed state

66. Galactosemia:

a) Is caused by increased galactose intake
b) Can be avoided by using sucrose-free diet
c) Is associated with hypoglycemia
d) Results from galactose-1-phosphate uridyl transferase deficiency
e) Is a genetic disorder caused by lactase deficiency

67. Hereditary fructose intolerance*:*

a) Is always associated with hypoglycemia
b) Results from fructokinase deficiency
c) Results from aldose b deficiency
d) Results in accumulation of fructose-6-phosphate
e) Can be treated by restriction of lactose in the diet

68. Muscle glycogen:

a) Accumulates in lysosomes in Pomp's disease
b) Is largely depleted by marathon running
c) Provides phosphohexoses for muscular glycolysis
d) Provides most of glucose in the blood
e) A, B and C are correct

69. An enzyme that produces non-mitochondrial NADH is:

a) Alpha-ketoglutarate dehydrogenase
b) Glyceraldehyde 3 phosphate dehydrogenase
c) Succinate dehydrogenase
d) 6-phophogluconate dehydrogenase
e) 3-HMG CoA synthase

70. Glycerol-3-Phosphate:

a) Is produced by reduction of dihydroxyacetone phosphate
b) Is precursor of phosphatidic acid
c) Can be produced by glycerol kinase
d) Is intermediate in TAG synthesis
e) All of the above is correct

71. The following agent interferes with oxidative phosphorylation*:*

a) Cyanide inhibits NADH dehydrogenase
b) Carbon monoxide inhibits coenzyme Q
c) Rotenone enhances electron transfer
d) Oligomycin inhibits complex I
e) Dinitrophenol uncouples phosphorylation from electron transfer

72. In the fed state*:*

a) Glucose is converted to glycogen and stored in skeletal muscle
b) Adipose tissue converts triglycerides to glucose
c) Amino acids are transaminated to form ketone bodies
d) Glycogen stores in liver are depleted
e) Glycogen phosphorylase is in the active form

73. Twenty four hours after a meal, the primary source of glucose carbons for the brain is:

a) Skeletal muscle protein
b) Glycerol from adipose tissue
c) Dietary glucose
d) Muscle glycogen
e) Both A and B are correct

74. Activity of the following enzyme is expected to increase in the fed-state:

a) Lactate dehydrogenase
b) Glucose 6-Phosphate dehydrogenase
c) Glucose 6-Phosphatase
d) Glycogen phosphorylase
e) PEP carboxykinase

75. The following enzymes are absent in muscles but are present in the liver*:*

a) Pyruvate carboxylase and citrate synthase
b) Glucose-6-phosphatase and glycerol kinase
c) Lactate dehydrogenase and isocitrate dehydrogenase
d) Pyruvate dehydrogenase and beta-ketothiolase
e) Glycogen synthase and 3HMG CoA synthase

76. Concerning inhibition of the electron transport chain*:*

a) Cyanide inhibits NADH dehydrogenase
b) Carbon monoxide inhibits coenzyme Q
c) Rotenone enhances electron transfer
d) Oligomycin inhibits complex I
e) Dinitrophenol uncouples phosphorylation from electron transfer

77. Liver glycogen synthase and PFK-1:

a) Are activated simultaneously in the fed state
b) PFK-1 is activated before glycogen synthase
c) Both are allosteric enzymes
d) Both are activated by insulin
e) All of the above is correct

78. Insulin activates PFK-1 in the liver by:

a) Increasing the level of AMP
b) Phosphorylation
c) Increasing the level of fructose 2,6 bisphosphate
d) Inhibiting fructose 1,6 bisphosphatase
e) None of the above

79. Metabolism of the major fuels mostly culminate in:

a) Glucose 6 phosphate
b) Pyruvate
c) Oxaloacetate
d) Acetyl CoA
e) Fumerate

80. In the liver during the fed state:

a) Glucokinase indirectly enhances uptake of glucose
b) Hexokinase is inhibited
c) Glucose 6 phosphate dehydrogenase is very active
d) Glycogen phosphorylase is dephosphorylated
e) All of the above is correct

81. Glycerol 3 phosphate dehydrogenase:

a) Converts glycerol 3 phosphate to DHAP in the fed state
b) Converts DHAP to glycerol 3 phosphate in the fasting state
c) Catalyses a reversible reaction
d) Is an allosteric enzyme
e) Is a glycolytic enzyme

82. Liver enzymes which are active in the fed state include:

a) Glycerol kinase
b) PEP carboxykinase
c) Pyruvate kinase
d) Glucose 6 phosphatase
e) Glycogen phosphorylase

83. Insulin:

a) Activates acetyl CoA carboxylase
b) Causes the phosphorylation of acetyl CoA carboxylase
c) Stimulates lipolysis
d) Inhibits the formation of malonyl CoA
e) Inhibits fatty acid synthesis in adipose cells

84. Insulin exerts its effect on target tissue through:

a) Enhancing tyrosine synthesis
b) Binding tyrosine kinase receptor
c) Increasing phosphorylation of all cellular proteins
d) Increasing intracellular cAMP
e) Inhibition of protein kinase C

85. Glucagon:

a) Is a steroid hormone
b) Binds intracellular receptors
c) Mimic all actions of epinephrine
d) Enhances glycogenolysis in the liver
e) Is transcriptional enhancer

86. Hypoglycemia:

a) Is caused by hyperinsulinemia
b) Is prominent feature of DKA
c) Enhances release of glucagon
d) Affects the brain seriously
e) B is the only wrong statement

88. In Diabetes Mellitus:

a) Type II is more common than type one
b) Type I is more serious than type II
c) Type I is called insulin dependent
d) DKA is usually associated with type I
e) All of the above is correct

89. Glucose alanine cycle:

a) Serves to carry amino groups from the skeletal muscle to the liver
b) Requires participation of gluconeogenesis in the liver
c) Provides the working muscle with glucose made by the liver
d) Requires participation of transamination reactions in both the skeletal muscle and the liver
e) All of the above is correct

90. Lactate is increased in the blood:

a) During sleep
b) During exercise
c) In Von Gierke's disease
d) Thiamin deficiency
e) B, C and D are correct

91. Glucose, fatty acids and ketone bodies are normally oxidized for ATP production by:

a) Liver
b) Skeletal muscle
c) Brain
d) Red blood cell
e) All of the above is correct

92. During prolonged starvation, all of the following tissues can use fuels other than glucose *except*:

a) Red blood cells
b) Muscle
c) Brain
d) Kidney
e) Adipose tissues

93. The enzyme which is not involved in glycolysis is:

a) Aldolase
b) Enolase
c) Pyruvate kinase
d) Phosphoglycerate mutase
e) Alpha phosphoglycerate dehydrogenase

94. Activation of phosphofructokinase-1 in the liver:

a) Inhibits hexokinase
b) Enhances gluconeogenesis
c) Enhances the activity of pyruvate kinase
d) Occurs as a result of high glucagons/insulin ratio
e) Results in accumulation of fructose 6 phosphate

95. Which of the following glycolytic intermediates is converted to a precursor of TAG synthesis*:*

a) Glucose 6 phosphate
b) Fructose 6 phosphate
c) Dihydroxyacetone phosphate
d) Pyruvate
e) PEP

96. Human liver usually produces glucose during prolonged fasting from*:*

a) Palmitic acid and alanine
b) Glycerol and lactate
c) Leucine and Serine
d) Galactose and fructose
e) Lactate and acetyl CoA

97. The Electron Transport Chain*:*

a) Produces ATP at substrate level
b) Produces 3 ATP's per $FADH_2$
c) Gets NADH and $FADH_2$ from beta oxidation and TCA cycle
d) Occurs in the mitochondrial matrix
e) Is inhibited by carnitine

98. The Hexose Monophosphate Shunt*:*

a) Is the same as PPP
b) Releases CO_2
c) Produces NADPH
d) Is active in the adrenal cortex
e) All of the above is correct

99. Phosphofructokinase-1*:*

a) Allosteric enzyme
b) Activated by ATP
c) Catalyses a reversible step
d) Produces fructose 2,6 bisphosphate
e) All of the above is correct

100. Type 1 glycogen storage disease*:*

a) Is known as Cori's disease
b) Is associated with cardiomegally
c) Causes hyperglycemia
d) Is known as McArdle's disease
e) None of the above

101. In the TCA cycle*:*

a) Malate dehydrogenase catalyzes a reversible reaction
b) Malonate is an intermediate
c) Two ATP molecules are produced
d) All reactions are reversible
e) All intermediates are phosphorylated

102. In gluconeogenesis*:*

a) Lactate comes from the RBC's and the brain
b) Glycerol is produced from TAG in the adipose tissue
c) Linolenic acid is a substrate
d) The rate of glucose production increases during the fed state
e) B is the only correct answer

103. Glycogenolysis*:*

a) Is synthesis of glucose from non carbohydrates
b) Produces fructose 1 phosphate
c) Is a cytosolic pathway
d) Is active in the fed state
e) Require glycogen synthase

104. In galactosemia*:*

a) Galactosuria is the most serious maifestation
b) Cataract results from accumulation of galactose in the lens
c) Galactose is converted to galactitol
d) The liver function can be seriously affected as a result of phosphate depletion
e) Both C and D are correct

105. Oxidative PPP*:*

a) Needs F6P as Substrate
b) Is activated by high levels of NAP+
c) Catalyzes conversion of G6P to F6P
d) Is important in muscle during exercise
e) Is active in the fasting state

106. The TCA Cycle*:*

a) Provides Acetyl CoA for Ketone Body Synthesis
b) Is inactive in the absence of Oxygen
c) Converts all amino acids to Glucose by Gluconeogenesis
d) Is blocked by excessive Beta-Oxidation
e) Can convert Oxaloacetate to Pyruvate

107. Glucose-6-Phosphatase Deficiency*:*

a) Is known as Von Gierke's Disease
b) Is associated with Hypoglycemia
c) Inhibits Glycogenolysis & Gluconeogenesis in the liver
d) Is associated with Hyperuricemia
e) All of the above is correct

108. The following is required in both Glycogenesis and Glycogenolysis*:*

a) CTP
b) Phosphoglucomutase
c) Glucose residues are added to the reducing end of Glycogen
d) Glycogen Synthase
e) Insulin

109. The Liver*:*

a) Has a high capacity for Fatty Acid Oxidation
b) Can produce Glucose from Glycerol
c) Is the only site for Ketogenesis
d) Activates acetoacetate to acetoacetyl CoA
e) D is the only wrong answer

110. In the fed state, glucose reaching the liver has the following fates*:*

a) Is converted into Glycogen
b) May be converted into Triacylglycerols
c) Is oxidized to produce ATP
d) Is oxidized via PPP to generate ribose and NADPH
e) All of the above is correct

111. In the well-fed state*:*

a) There is high glucose level in the portal blood
b) There is high chylomicrons in the portal blood
c) Hexokinase is very active in the liver
d) Lipogenesis is active only in adipose tissue
e) The liver converts Lactate to Fatty Acids

112. The following liver enzymes have decreased concentration in the fasting state*:*

a) G-6-Phosphatase
b) Phosphoenolpyruvate Carboxykinase
c) F1,6-Bisphosphate
d) G-6-P Dehydrogenase
e) Pyruvate Carboxylase

113. Metabolism of major fuels (glucose, fatty acids, amino acids) mostly culminate in*:*

a) Glucose-6-Phosphate
b) Pyruvate
c) Oxaloacetate
d) Acetyl CoA
e) Fumerate

114. In the fed state, glucose reaching the liver has the following fates*:*

a) Is converted into Glycogen
b) May be converted into Triacylglycerols
c) Is oxidized to produce ATP
d) Is oxidized via PPP to generate ribose and NADPH
e) All of the above is correct

115. Glycogen synthesis*:*

a) Is a reversible pathway
b) Is a mitochondrial pathway
c) Is activated during the fasting state
d) Occurs in the liver and muscle
e) Produces Uridine Diphosphate from Glycogen

116. Fructose 2,6 bisphosphate:

a) Is not a glycolytic intermediate
b) Activates phosphofructokinase 1
c) Is synthesized by phopshofuctokinase 2
d) Inhibits fructose 1,6 bisphosphate
e) All of the above is correct

117. In glycogen storage diseases:

a) Fatigability and muscle cramps are main features of Von Geirke's disease
b) Hypoglycemia is the main feature of type V
c) Type II is associated with glucose 6 phosphatase deficiency
d) Type IV is due to deficiency of the branching enzyme
e) Hepatomegally is the main feature of all types

118. The following enzyme requires biotin as a coenzyme:

a) Fructose 1,6-bisphoshate
b) Pyruvate kinase
c) PEP carboxykinase
d) Pyruvate carboxylase
e) Malate dehydrogenase

119. All the following enzymes are present in the liver and muscle *except*:

a) Pyruvate Carboxylase
b) Glycogen Synthase
c) Lactate Dehydrogenase
d) Pyruvate Dehydrogenase
e) Glucose-6-Phosphatase

120. The Pyruvate Dehydrogenase Complex*:*

a) Requires pyridoxal phosphate
b) Deficiency results in pernicious anemia
c) Is inactive when Vitamin B1 is deficient
d) Catalyzes a carboxylation reaction
e) Is a key enzyme in the Red Blood Cell